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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PAIK, SANG YEOP

ART UNIT	PAPER NUMBER
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3742

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/652,493

Applicant(s)

CHOE ET AL.

Examiner

Sang Y. Paik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow (US 5,157,240) in view of Chandler (US 2,799,764) or Isaacson et al (US 3,842,241).

Chow shows a heating crucible having a main body container, a cover formed of an insulating material such as the nitride ceramic with a nozzle, one or more heating elements as a cover heater formed as a thin film via chemical vapor deposition on a top surface of the cover wherein one heating element would form a single layer heater, a body heater for heating the main body, the cover heater having a wire pattern formed over the entire top surface of the cover with the positive and negative thermals, a thermocouple in the cover, a heat-resistant layer (25') on the cover heater, the main body also formed of an insulating material such as the nitride ceramic with a body heater as a thin film on the outer wall of the main body, a heat resistant layer (25) on the body heater, the body heater having a single wire pattern with the positive and negative terminals, and a thermocouple inside the main body. However, Chow does not show a heat reflective layer between the heater and the heat-resistant layer.

Chandler or Isaacson shows that it is well known in the art to provide a heating device having a heating element provided with a heat reflective layer to direct the heat toward the

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desired heating surface. In Chandler, it is shown that the heating element (72) is provided on a heating surface (76) with a heat reflecting layer (62) disposed between the heating element and a heat resistant/insulating layer (78). Isaacson also shows a heating surface (14) upon which a heating element (50) provided thereto with a heat reflective layer (56) disposed between the heating element and a heat resistant layer (40).

In view of Chandler or Isaacson, it would have been obvious to one of ordinary skill in the art to adapt Chow with a reflective layer provided between the heat resistant layer and the heater to reflect the heat generated by the heater toward an intended heating direction.

With respect to claim 9, Chow shows the cover having a nozzle in the center of the cover with a cover heater provided around the nozzle. However, while, Chow does not show that the cover heater concentric pattern around the nozzle, it would have been obvious to one of ordinary skill in the art to provide the cover heater in the concentric pattern or any other pattern to effectively provide uniform and stable heating across the cover.

With respect to the method by which the heating element or block is provided on the cover and how such is formed, it is noted that the pending claims are apparatus or product and such is defined by the product itself and not by the process it is produced.

3. Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 above, and further in view of Kano et al (US 6,242,719).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater being platinum.

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Kano shows a heating element such as platinum or graphite deposited or printed via the chemical vapor deposition on an insulating ceramic layer such as pyrolytic boron nitride or aluminum nitride. In view of Kano, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of platinum as an alternative conductive material that can alternatively provide stable and uniform heating temperature, and with respect to claim 14, it would have been obvious to further provide insulating material made of aluminum nitride that alternatively provide a good electrical and thermally conductive material.

4. Claims 8, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 above, and further in view Bichrt (US 6,162,300).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover or the main body is made of alumina or silicon carbide

Bichrt shows a ceramic body made of alumina or silicon carbide as well as pyrolytic boron nitride. In view of Bichrt, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover and the main body made of alumina or silicon carbide in place of the pyrolytic boron nitride since such is well known in the art to alternatively provide a mechanically and thermally stable body that can withstand a temperature, pressure and chemical stress.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Okuda et al (US 4,804,823).

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Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater is made of conductive paste with metal particles and metal oxides.

Okuda show that it is known in the art to provide a conductive paste made with metal particles or metal oxides applied to a ceramic substrate to form a sintered electrical heater. In view of Okuda, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of conductive paste having the metal particles and metal oxides to form a heating element that can provide a mechanically and thermally stable heater that can also withstand a high temperature.

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 20-25 and 29 above, and further in view Takagi (US 4,217,855).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except on the entire outer bottom wall of the main body.

Takagi shows a heating crucible having a main body wherein the heating element is provided along the entire body including the bottom wall of the crucible (see Figure 8).

In view of Takagi, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the crucible having the bottom wall with the heating element formed on the entire surface as an alternative form to efficiently and adequately heat the content of the crucible.

7. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18, 21-25 and 29-31 above, and further in view Chen et al (US 6,024,799) or Murakami et al (US 5,728,223).

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Chow in view of Chandler or Isaacson shows the heating crucible claimed except the nozzle having a convergent-divergent nozzle.

Chen and Murakami show that it is well known in the art to provide the gaseous outlet nozzle with a convergent-divergent nozzle that is flush with the gas outlet surface cover. In view of Chen or Murakami, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the nozzle having a convergent-divergent nozzle to provide a more defined outlet gas flow for even distribution of the vapor deposition.

Response to Arguments

8. Applicant's arguments filed 7/27/2006 have been fully considered but they are not persuasive.

With respect to Chow, the applicant argues that since the layer 25' of Chow is disclosed as a protective layer and not as a "heat-resistant layer" as recited in the claims, Chow does not meet the recited claims. The applicant argues that the applicant's disclosure of the "heat-resistant layer" formed of a "thin film type" meaning a thin film type heat-resistant layer is one example and the examiner's interpretation of any thin film being a heat resistant layer is incorrect. It is clearly shown that the protective layer of Chow is a thin material, and there is no other support how the heat-resistant layer is defined or taught except for it being a thin layer. If there is other teaching how this heat-resistant layer is defined or taught, other than being a thin layer, from the specification, the applicant is invited to point out how this heat-resistant layer is defined. It is also noted that no new matter should be introduced.

With respect to Chandler, the applicant argues the layer 78 which is disclosed as a paper, paperboard, cloth, or other suitable material but it does not recited them as a heat-resistant layer.

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This argument is not deemed persuasive. The disclose material of Chandler is capable of being a heat-resistant layer and there is no reason why this layer cannot be served as a heat-resistant layer. A layer that impedes a heat transfer maybe considered as a heat-resistant layer, and the applicant has not disclosed that such material would be contrary to the applicant's definition of the heat-resistant layer. There is no other showing in the applicant's claim how the heat-resistant layer is defined or shown to be distinguishable over the prior art. It is notoriously known to one of ordinary skill in the art as well as a lay person that a paper such as paper tower or cloth such as a kitchen towel is used to hold and remove a hot pan off a stove. This is notoriously practiced to show that a paper and cloth is used as a heat-resistant material to insulate or impede the heat transfer to the person holding such pan so the persons would not be burned. However, it is further noted that the claims are interpreted in light of the specification, and the applicant is invited to point out where in the specification the heat-resistance layer is defined or shown to be distinguishable over the prior art. No new matter is to be introduced.

Likewise, with respect to Isaacson, the applicant argues the layer 40 which is disclosed as a holder constructed of plastic, is not the heat-resistant layer. But this argument is not deemed persuasive since there is no reason why this layer cannot be a heat-resistant layer as it provides the support and protection to the heater. In both Chandler and Isaacson, a reflective layer is provided between a heater and a heat-resistant layer such heat is directed toward the direction of heater and away from the heat-resistant layer. Therefore, it would have been obvious to one of ordinary skill in the art to further adapt Chow with a reflective layer between the heater and the heat-resistant layer so that heat is directed toward the heater which is the desired heat direction.

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With respect to claims 2 and 18, the applicant argues that the recited single wire pattern wherein the term “single” means “not accompanied by another or others” and as such the two heating elements pattern of Chow cannot be “a single wire pattern” as recited in the claims. While Chow shows two wires, the claimed scope of “a single wire” is still met by Chow since single or one wire is included by two wires, each of the two wires being a single wire. Furthermore it is noted that Chow teaches that the heating element can be one or more (see column 2, lines 27-30). This clearly meets the claimed recitations.

With respect to claims 7 and 25, the applicant argues that the recited insulating materials having a good heat radiation property defines over the insulating material pyrolytic boron nitride as shown in Chow. The applicant argues that because the material in Chow does not show that such material “has a good heat radiation property, it fails to meet claims 7 and 25. The applicant’s attention is directed to MPEP 2112.01. It states that when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed be inherent. In this case the structure or the material recited is the “insulating material”. It is also noted that there is no other recitation with respect to the composition of such insulating material. Given such a broad structure, the property relating to the heat radiation is presumed to be inherently met by Chow.

With respect to claim 9, the applicant argues that the examiner has not provided the motivation to modify the Chow’s cover heater to be “formed in a concentric patter around the nozzle”. This argument is not deemed persuasive. Chow discloses that it is important to provide a good uniform heat distribution to avoid hot and cold zones (see column 1, lines 60-68) and this would have been the motivation to provide the heating pattern in the concentric pattern. Chow

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shows a heating wire that encircles a hole or nozzle, and to one of ordinary skill in the art, it would have been obvious to modify the heating pattern in a concentric pattern or any other suitable pattern that would have provided a good uniform heating so that vaporization out of the nozzle is evenly heated. It is also noted that the applicant allows other forms of heating pattern other than a concentric pattern (paragraph 31). This is not the hindsight upon which the examiner has relied but rather this particular applicant's disclosure goes to the non-criticality of the heating pattern of a concentric pattern as opposed to other form of heating pattern as long as a uniform heating can be maintained.

With respect to claim 16, it is further noted that such claim is a product by process claim wherein the patentability is defined by the product itself and not by the process. All the structure of claim 16 is shown, and the applicant's argument is not deed persuasive.

With respect to Okuda, the applicant argues that the metal nitride or carbide particles of Okuda do not meet the recited "metal particles". The recited metal particles are particles that are made of metals. The particles of Okuda are made of metals as well. This clearly meets the recited "metal particles". The applicant is invited to show if there is other definition or teaching in the applicant's disclosure that would be distinguishable over the prior art wherein the particles made of metal in Okuda are not the claimed "metal particles". No new matter is to be introduced in the specification.

With respect to the recited "convergent-divergent nozzle", the applicant argues Chow shows a converging material beam because Chow shows its beam to having a "good directivity". Having a good directivity does not necessarily mean "converging" beam as argued by the applicant. In fact, the nozzle 19' in Figure 7 of Chow shows a nozzle with a widening open end

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as the beam is let out. This creates more of a divergent pattern than a converging pattern. This clearly shows why the good directivity does not necessarily mean a converging outlet.

With respect to the recited single-layer cover or body heater, the applicant shows different layers of Chow including the first and second heating element with an insulating layer to show that Chow cover is a three layer heater. Applying the same analysis, the applicant's cover heater would be a two layer heater having a heating element and an insulating layer rather than a single layer heater as recited, but nevertheless since the claim 30 seems to indicate the single layer relates to having a single or one cover heater, i.e., the heating element, and since Chow teaches only one heating element can be used, as shown in column 2, lines 27-30, the recited single layer cover heater and the single layer body heater are met by Chow.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S. Paik

Sang Y Paik
Primary Examiner
Art Unit 3742

syp